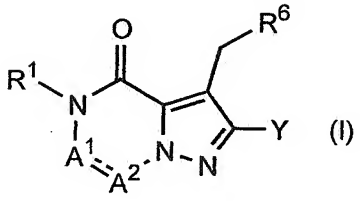
CLAIMS

1. A compound represented by the formula (I):



(I)

wherein R^1 is a hydrogen atom, an optionally substituted alkyl group, an optionally substituted cycloalkyl group, an optionally substituted aryl group, or an optionally substituted heteroaryl group;

the solid line and dotted line between A^1 and A^2 indicate a double bond (A^1=A^2) or a single bond (A^1-A^2);

A^1 is a nitrogen atom or a group represented by the formula $C(R^2)$ and A^2 is a group represented by the formula $C(R^4)$, in the case of the solid line and dotted line between A^1 and A^2 being a double bond (A^1=A^2);

A^1 is a group represented by the formula $C(R^2)(R^3)$ and A^2 is a group represented by the formula $C(R^4)(R^5)$, in the case of the solid line and dotted line between A^1 and A^2 being a single bond (A^1-A^2);

R^1 and R^2 may be taken together with the adjacent nitrogen atom and carbon atom to form an optionally substituted 4- to 7-membered ring in the case of the solid line and dotted line between A^1 and A^2 being a double bond (A^1=A^2) and A^1 being a group represented by the formula $C(R^2)$;

R^2 is a hydrogen atom, a halogen atom, a cyano group, a formyl group, an optionally substituted alkyl group, an optionally substituted cycloalkyl group, an optionally substituted cycloalkyloxy group, an optionally substituted alkenyl group, an optionally substituted alkynyl group, an optionally substituted amino group, an optionally substituted carbamoyl group, a carboxyl group, an optionally substituted alkoxy group, an optionally substituted alkoxycarbonyl group, an optionally substituted cycloalkyloxycarbonyl group, a tetrahydrofuranyloxycarbonyl group, an optionally substituted aryl group, an optionally substituted aryloxy group, an optionally substituted aryloxycarbonyl group, an optionally substituted aralkyl group, an optionally substituted aralkyloxy group, an optionally substituted aroyl group, an optionally substituted arylthio group, an optionally substituted arylsulfinyl group, an optionally substituted arylsulfonyl group, an optionally substituted alkylthio group, an optionally substituted alkylsulfinyl group, an optionally substituted alkylsulfonyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted heteroarylcarbonyl group, an optionally substituted heteroaryloxy group, an optionally substituted alkylcarbonyl group, an optionally substituted cycloalkylcarbonyl group, or an optionally substituted

nitrogen-containing saturated heterocyclic group;

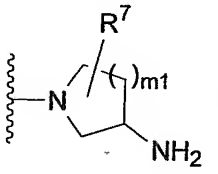
R^3 is a hydrogen atom, a halogen atom, a cyano group, an optionally substituted alkyl group, an optionally substituted cycloalkyl group, an optionally substituted carbamoyl group, a carboxyl group, an optionally substituted alkoxy group, an optionally substituted alkoxycarbonyl group, an optionally substituted aryl group, an optionally substituted aryloxycarbonyl group, an optionally substituted aralkyl group, an optionally substituted aroyl group, an optionally substituted aryloxy group, an optionally substituted arylthio group, an optionally substituted arylsulfonyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted heteroarylcarbonyl group, an optionally substituted heteroaryloxy group, or an optionally substituted alkylcarbonyl group;

R^4 and R^5 are independently a hydrogen atom, a halogen atom, a cyano group, an optionally substituted alkyl group, an optionally substituted cycloalkyl group, an optionally substituted carbamoyl group, a carboxyl group, an optionally substituted alkoxy group, an optionally substituted cycloalkyloxy group, an optionally substituted alkoxycarbonyl group, an optionally substituted amino group, an optionally substituted aryl group, an optionally substituted aryloxycarbonyl group, an optionally substituted

aralkyl group, an optionally substituted aroyl group, an optionally substituted aryloxy group, an optionally substituted arylthio group, an optionally substituted arylsulfonyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted heteroarylcarbonyl group, or an optionally substituted alkylcarbonyl group;

R^6 is a hydrogen atom, an optionally substituted alkyl group, an optionally substituted cycloalkyl group, an optionally substituted aryl group, an optionally substituted vinyl group, an optionally substituted ethynyl group, an optionally substituted nitrogen-containing saturated heterocyclic group, or an optionally substituted heteroaryl group; and

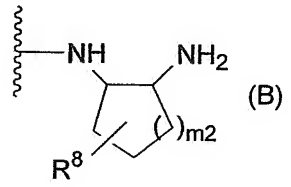
-Y is any of groups represented by the formula (A), formula (B), formula (C) and formula (D) shown below:



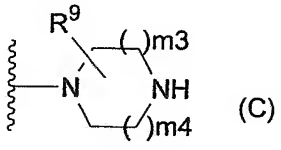
(A)

wherein m1 is 0, 1, 2 or 3, and R^7 is absent or one or two R^7s are present and are independently a halogen atom, a hydroxyl group, an oxo group, an optionally substituted alkoxy group, an optionally substituted alkyl group, an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally

substituted amino group, a carboxyl group, an optionally substituted alkoxycarbonyl group or an optionally substituted carbamoyl group, or two R^7s, when taken together, represent methylene or ethylene and may bind to one or more carbon atoms constituting the ring, to form a new ring;

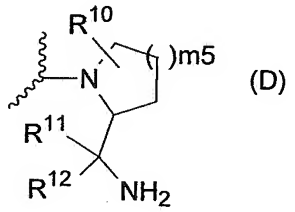


wherein m2 is 0, 1, 2 or 3, and R^8 is absent or one or two R^8s are present and are independently a halogen atom, a hydroxyl group, an oxo group, an optionally substituted alkoxy group, an optionally substituted alkyl group, an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted amino group, a carboxyl group, an optionally substituted alkoxycarbonyl group or an optionally substituted carbamoyl group, or two R^8s, when taken together, represent methylene or ethylene and may bind to one or more carbon atoms constituting the ring, to form a new ring;



wherein m3 and m4 are independently 0 or 1, and R^9 is absent or one or two R^9s are present and are

independently a halogen atom, a hydroxyl group, an oxo group, an optionally substituted alkoxy group, an optionally substituted alkyl group, an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted amino group, a carboxyl group, an optionally substituted alkoxycarbonyl group or an optionally substituted carbamoyl group, or two R^9s, when taken together, represent methylene or ethylene and may bind to one or more carbon atoms constituting the ring, to form a new ring; and

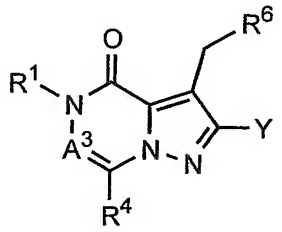


(D)

wherein m5 is 1, 2 or 3, R^{10} is absent or one or two R^{10}s are present and are independently a halogen atom, a hydroxyl group, an oxo group, an optionally substituted alkoxy group, an optionally substituted alkyl group, an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted amino group, a carboxyl group, an optionally substituted alkoxycarbonyl group or an optionally substituted carbamoyl group, or two R^{10}s, when taken together, represent methylene or ethylene and may bind to one or more carbon atoms constituting the ring, to form a new ring, and R^{11} and R^{12} are independently a

hydrogen atom, methyl, ethyl, propyl or isopropyl, or R^{11} and R^{12}, when taken together with the adjacent carbon atom, represent cyclopropyl, cyclobutyl or cyclopentyl, a prodrug of said compound, or a pharmaceutically acceptable salt of said compound or prodrug.

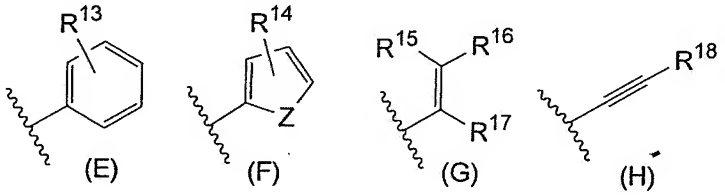
2. A compound according to claim 1, which is represented by the formula (II):



(II)

wherein A^3 is a nitrogen atom or a group represented by the formula $C(R^2)$, and R^1, R^2, R^4, R^6 and Y are as defined in claim 1, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug.

3. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to either of claims 1 and 2, wherein R^6 is the following formula (E), formula (F), formula (G) or formula (H):



wherein Z is an oxygen atom, the formula S(O)p or

$N(R^{19})$;

R^{13} is absent or one or two R^{13}s are present and are independently a halogen atom, a hydroxyl group, a formyl group, a carboxyl group, a cyano group, an alkylthio group, an alkylsulfinyl group, an alkylsulfonyl group, an alkyl group, a haloalkyl group, a cycloalkyl group, an alkoxy group, a haloalkoxy group, an optionally substituted amino group, an optionally substituted carbamoyl group, an alkoxycarbonyl group, an optionally substituted alkylcarbonyl group, a cycloalkylcarbonyl group, an optionally substituted phenyl group, an optionally substituted heteroaryl group or a nitrogen-containing saturated heterocyclic group, or two R^{13}s, when taken together, represent a C_{1-3} alkylenedioxy group;

R^{14} is absent or one or two R^{14}s are present and are independently a halogen atom, a cyano group, an alkyl group, a haloalkyl group, a cycloalkyl group, an alkoxy group or a haloalkoxy group;

R^{15} is methyl, ethyl, a chlorine atom or a bromine atom;

R^{16} is a hydrogen atom, methyl, ethyl, a chlorine atom or a bromine atom;

R^{17} is a hydrogen atom, methyl or ethyl;

R^{18} is a hydrogen atom, methyl, ethyl, cyclopropyl or cyclobutyl;

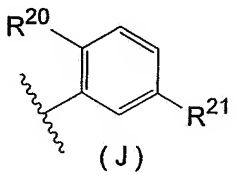
p is 0, 1 or 2; and

R^{19} is a hydrogen atom or an alkyl group.

4. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to claim 3, wherein R^6 is the formula (E) or the formula (H).

5. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to claim 4, wherein R^6 is the formula (E) and one or two R^{13} are present and are independently a halogen atom, a cyano group, an alkylthio group, an alkylsulfonyl group, a C_{1-3} alkylenedioxy group, an alkyl group, a haloalkyl group, a cycloalkyl group, an alkoxy group or a haloalkoxy group.

6. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to either of claims 1 and 2, wherein R^6 is the following formula (J):



(J)

wherein R^{20} is a halogen atom, a cyano group, an alkylthio group, an alkylsulfonyl group, an alkyl group, a haloalkyl group, a cycloalkyl group, an alkoxy group or a haloalkoxy group, and R^{21} is a hydrogen atom or a fluorine atom.

7. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 6, wherein Y is the

formula (A) or (B).

8. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 6, wherein Y is the formula (A).

9. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 8, wherein R^2 is a hydrogen atom, a cyano group, an optionally substituted alkyl group, an optionally substituted cycloalkyl group, an optionally substituted alkenyl group, an optionally substituted carbamoyl group, a carboxyl group, an optionally substituted alkoxycarbonyl group, an optionally substituted cycloalkyloxycarbonyl group, a tetrahydrofuranyloxycarbonyl group, an optionally substituted aryl group, an optionally substituted aryloxycarbonyl group, an optionally substituted aralkyl group, an optionally substituted aroyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted heteroarylcarbonyl group or an optionally substituted alkylcarbonyl group.

10. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 8, wherein R^2 is a hydrogen atom, a cyano group, an optionally substituted alkyl group, an optionally substituted carbamoyl group, a carboxyl group, an optionally substituted

alkoxycarbonyl group, an optionally substituted cycloalkyloxycarbonyl group, a tetrahydrofuranyloxycarbonyl group, an optionally substituted aryl group, an optionally substituted aryloxycarbonyl group, an optionally substituted aralkyl group, an optionally substituted aroyl group, an optionally substituted heteroaryl group or an optionally substituted alkylcarbonyl group.

11. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 10, wherein R^4 is a hydrogen atom, an optionally substituted alkyl group, a cyano group, an optionally substituted carbamoyl group, a carboxyl group, an optionally substituted alkoxy group, an optionally substituted cycloalkyloxy group, an optionally substituted alkoxycarbonyl group, an optionally substituted aryl group, an optionally substituted aryloxycarbonyl group, an optionally substituted aralkyl group, an optionally substituted aroyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted heteroarylcarbonyl group or an optionally substituted alkylcarbonyl group.

12. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 10, wherein R^4 is a hydrogen atom or an optionally substituted alkyl group.

13. A compound, a prodrug thereof or a pharma-

ceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 10, wherein R^4 is the formula: $-C(R^{22})(R^{23})-A^4-R^{24}$ in which R^{22} and R^{23} are independently a hydrogen atom, methyl, ethyl, propyl, isopropyl, methoxy or ethoxy, or R^{22} and R^{23}, when taken together with the adjacent carbon atom, represent cyclopropyl, cyclobutyl or cyclopentyl; A^4 is a single bond, methylene or ethylene; and R^{24} is a hydrogen atom, a cyano group, an alkyl group, a haloalkyl group, a cycloalkyl group, a tetrahydrofuranyl group, an optionally substituted carbamoyl group, a carboxyl group, an optionally substituted alkoxy group, an optionally substituted aryloxy group, an optionally substituted alkoxycarbonyl group, an optionally substituted aryl group, an optionally substituted aryloxycarbonyl group, an optionally substituted aroyl group, an optionally substituted heteroarylcarbonyl group or an optionally substituted alkylcarbonyl group.

14. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 13, wherein R^1 is a hydrogen atom, an optionally substituted alkyl group of 1 to 3 carbon atoms, or an optionally substituted aryl group, and the substituent(s) of the optionally substituted alkyl group is selected from fluorine atom, optionally substituted aroyl groups, carboxyl group, optionally substituted alkoxycarbonyl groups, optionally substituted aryl groups and optionally

substituted aryloxy groups.

15. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 13, wherein R^1 is a hydrogen atom, methyl or a group represented by the formula: -Ra-Rb-Rc in which

Ra is an alkylene chain;

Rb is a single bond or a carbonyl group; and

Rc is an optionally substituted alkyl group, an optionally substituted alkoxy group, an optionally substituted aryl group, an optionally substituted heteroaryl group, an optionally substituted heteroaryloxy group or an optionally substituted aryloxy group.

16. A pharmaceutical composition comprising a compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 15 as an active ingredient.

17. A dipeptidyl peptidase IV inhibitor comprising a compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 15 as an active ingredient.

18. A pharmaceutical composition for the treatment of diabetes comprising a compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 15 as an active ingredient.

19. Use of a compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 15 in the manufacture of a dipeptidyl peptidase IV inhibitor.

20. Use of a compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 15 in the manufacture of a pharmaceutical composition for the treatment of diabetes.

21. A method for treating diabetes comprising administering an effective amount of a compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 15 to a patient who needs treatment.